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BOARD OF PATENT APPEALS  
AND INTERFERENCES

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

Ex parte SHADI L. MALHOTRA

Appeal No. 2002-0728  
Application No. 09/404,570<sup>1</sup>

ON BRIEF

Before PAK, OWENS, and DELMENDO, Administrative Patent Judges.  
PAK, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134 from the examiner's refusal to allow claims 1 through 21, 23 and 24. Claim 22, the only remaining claim pending in the present application, has been allowed.

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<sup>1</sup> This appeal is related to Appeal No. 2002-0699 involving Application 09/401,740.

APPEALED SUBJECT MATTER

Claims 1, 6, 7, 10, 14 and 23 are representative of the subject matter on appeal and read as follows:<sup>2</sup>

1. A hot melt ink composition comprising (a) an aldehyde copolymer ink vehicle, (b) a nonpolymeric aldehyde viscosity modifier, (c) a colorant, (d) an optional conductivity enhancing agent, (e) an optional antioxidant, and (f) an optional UV absorber.
6. An ink composition according to claim 1 wherein the ink exhibits a conductivity of no less than about 6 log(picomho/cm).
7. An ink composition according to claim 1 wherein images generated with the ink exhibit a haze value of no more than about 25.
10. An ink composition according to claim 1 wherein the nonpolymeric aldehyde viscosity modifier is 3-hydroxy benzaldehyde, 4-hydroxy benzaldehyde, 4-benzyloxy benzaldehyde, 2-carboxy benzaldehyde, 4-nitro benzaldehyde, 2,3-dihydroxy benzaldehyde, 2,5-dihydroxy benzaldehyde, 3-hydroxy-4-methoxy benzaldehyde, 4-hydroxy-3-methoxy benzaldehyde, 4-hydroxy-3-ethoxy benzaldehyde, 4-hydroxy-3-methyl benzaldehyde, 2-hydroxy-5-nitrobenzaldehyde, 3-hydroxy-4-nitrobenzaldehyde, 4-hydroxy-3-nitrobenzaldehyde, 3,4-dibenzyloxy benzaldehyde, 3,5-dibenzyloxy benzaldehyde, 4-acetoxy-3,5-dimethoxy benzaldehyde, 2-amino-3,5-dibromo benzaldehyde, 2-

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<sup>2</sup> According to the appellant (Brief, Page 7):

The rejected claims do not stand or fall together.  
Appellant will discuss distinctions between all of the appealed claims....

However, the appellant only argues the examiner's individual rejections and the limitations of claims 4 and 10 separately. Therefore, for purposes of this appeal, we select claims 1, 4, 6, 7, 10, 14, 23 from all of the appealed claims and determine the propriety of the examiner's rejections based on these claims consistent with 37 CFR § 1.192(c)(7) (2001).

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benzyloxy-4,5-dimethoxy benzaldehyde, 5-bromo-2-hydroxy-3-methoxy benzaldehyde, 4-hydroxy-3,5-dimethoxy benzaldehyde, 2,3,5-trichlorobenzaldehyde, 2,3,6-trichlorobenzaldehyde, 2,4,5-trimethoxy benzaldehyde, 2,4,6-trimethoxy benzaldehyde, 3,5-dichloro-2-hydroxy-benzaldehyde, 3,5-dibromo-2-hydroxy-benzaldehyde, 3,5-diiodo-2-hydroxy-benzaldehyde, 3,4-dihydroxy-5-methoxy benzaldehyde, 3,5-dimethyl-4-hydroxy benzaldehyde, 2,6-dimethoxybenzaldehyde, 2-nitro cinnamaldehyde, 4-(diethylamino) cinnamaldehyde, 4-acetoxy-3-methoxy cinnamaldehyde, 4-hydroxy-3-methoxy cinnamaldehyde, 2-hydroxy-1-naphthaldehyde, 2-methoxy-1-naphthaldehyde, 9-anthraldehyde, 5-bromo-2-furaldehyde, 5-nitro-2-thiophene carboxaldehyde, 9-ethyl-3-carbazole carboxaldehyde, 4-stillbene carboxaldehyde, 2-hydroxy-5-methyl-1,3-benzene dicarboxaldehyde, terephthal dicarboxaldehyde, 2-(diphenylphosphino) benzaldehyde, 1-(phenylsulfonyl)-2-pyrrolicarboxaldehyde, 1-pyrene carboxaldehyde, phenanthrene carboxaldehyde, 2-fluorene carboxaldehyde, or mixtures thereof.

14. An ink composition according to claim 1 containing a conductivity enhancing agent which is a complex of a dianiline and a phosphorus-containing acid.

23. An ink composition according to claim 1 wherein the aldehyde copolymer ink vehicle is poly ((phenyl glycidyl ether)-co-formaldehyde), poly ((o-cresyl glycidyl ether)-co-formaldehyde), or mixtures thereof.

#### REFERENCES

The examiner relies on the following prior art references:

Watt	4,105,806	Aug. 8, 1978
Schwarz et al. (Schwarz)	5,122,187	Jun. 16, 1992
Takazawa et al. (Takazawa)	5,279,655	Jan. 18, 1994
Tobias et al. (Tobias)	5,286,288	Feb. 15, 1994
Shacklette	5,378,403	Jan. 3, 1995
Malhotra et al. (Malhotra)	5,931,995	Aug. 3, 1999
Siddiqui	5,939,468	Aug. 17, 1999
Nishizaki et al. (Nishizaki)	6,022,910	Feb. 8, 2000
Han	WO 93/22775	Nov. 11, 1993
(Published International Patent Application)		

REJECTIONS

The appealed claims stand rejected as follows:

- (1) Claims 1 through 5, 8 through 13 and 17 through 21 under 35 U.S.C. § 103, as unpatentable over Malhotra in view of either Schwarz or Siddiqui, Watt, and Takazawa;
- (2) Claims 6 and 16 under 35 U.S.C. § 103 as unpatentable over Malhotra in view of either Schwarz or Siddiqui, Watt, and Takazawa and further in view of Tobias;
- (3) Claim 7 under 35 U.S.C. § 103 as unpatentable over Malhotra in view of either Schwarz or Siddiqui, Watt, and Takazawa, and further in view of Nishizaki;
- (4) Claims 14 and 15 under 35 U.S.C. § 103 as unpatentable over Malhotra in view of either Schwarz or Siddiqui, Watt, and Takazawa, and further in view of Shacklette and Han; and
- (5) Claims 23 and 24 under 35 U.S.C. § 103 as unpatentable over the combined disclosures of Malhotra and Watt.

OPINION

We have carefully reviewed the claims, specification and applied prior art references, including all of the arguments and evidence advanced by both the examiner and the appellant in support of their respective positions. As a result of this review, we have made the determinations which follow.

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We turn first to the examiner's rejection of claims 1 through 5, 8 through 13 and 17 through 21 under 35 U.S.C. § 103 as unpatentable over Malhotra in view of either Schwarz or Siddiqui, Watt and Takazawa. We find that Schwarz discloses a hot melt ink composition comprising, inter alia, a colorant, a binder and a propellant. See column 4, lines 17-18 and the abstract. The exemplified binder is a formaldehyde-toluene-sulfonamide which is embraced by the claimed aldehyde copolymer ink vehicle. See, e.g., Examples III-VI, columns 16 and 17. The propellant includes, inter alia, aldehydes having **viscosities** sufficient to enhance refill, jettability, and substrate penetration characteristics of the ink composition. See column 14, lines 25-29 and 45. These aldehydes are embraced by the claimed nonpolymeric aldehyde viscosity modifier. Thus, we determine that Schwarz alone would have led one of ordinary skill in the art to select the claimed ingredients to form a hot melt ink composition, with a reasonable expectation of successfully improving its ink jet printing properties. See *Merck & Co. v. Biocraft Laboratories Inc.*, 874 F.2d 804, 807, 10 USPQ2d 1843, 1846 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989); *In re Petering*, 301 F.2d 676, 682, 133 USPQ 275, 280 (CCPA 1962).

The appellant argues that Schwarz does not teach or suggest the functional limitation relating to "the time required to change

the ink from a solid state to a liquid state" recited in claim 4. See the Brief, page 16. Schwarz, however, teaches that its hot melt ink composition has a melting temperature which almost entirely overlaps the preferred melting temperature of the claimed ink composition. See, e.g., column 6, lines 32-33. We also take official notice that one of ordinary skill in the art knows that the melting rate (time) of the hot-melt ink composition described in Schwarz is also dependent on the heating temperature employed. However, claim 4 does not specify a heating temperature. Thus, it is reasonable to conclude that the functional limitation recited in claim 4 does not distinguish the claimed ink composition from the ink composition suggested by Schwarz. *Compare In re Schreiber*, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1432 (Fed. Cir. 1997); *In re Yanush*, 477 F.2d 958, 959, 177 USPQ 705, 706 (CCPA 1973); *In re Casey*, 370 F.2d 576, 580, 152 USPQ 235, 238 (CCPA 1967); *In re Otto*, 312 F.2d 937, 939, 136 USPQ 458, 459 (CCPA 1963)

The appellant argues that none of the applied prior art references would have suggested the ink composition recited in claim 10. See the Brief, pages 12-13. We concur with the appellant that the examiner has not presented sufficient evidence to show that one of ordinary skill in the art would have been led to employ the aldehyde copolymer taught in Schwarz, Siddiqui and/or

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Watt in the ink composition of Malhotra. Specifically, the examiner has not established that one of ordinary skill in the art would have reasonably expected that the aldehyde copolymer useful for the ink composition of Schwarz, Siddiqui and/or Watt is useful for the purposes of Malhotra's ink composition. See the Answer in its entirety. In this regard, we note the applied prior art references are directed to employing materially different ingredients for different purposes.

Accordingly, we affirm the examiner's decision rejecting claims 1 through 5, 8, 9, 11 through 13 and 17 through 21 under 35 U.S.C. § 103, but reverse the examiner's decision rejecting claim 10 under 35 U.S.C. § 103.

We turn next to the examiner's rejection of claims 6 and 16 under 35 U.S.C. § 103 as unpatentable over Malhotra in view of either Schwarz or Siddiqui, Watt and Takazawa and further in view of Tobias. The content of Schwarz is discussed above. Schwarz does not mention that its hot melt ink composition has the claimed conductivity property.

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To remedy this deficiency, the examiner relies on the disclosure of Tobias. The examiner finds (Answer, page 7), and the appellant does not dispute (Brief, pages 26-28), that:

Tobias et al., which is drawn to hot melt inks, discloses the use of 0.1-5% conductivity agents in order to control the conductivity of the ink from 500-1500 microsiemens/cm or approximately 8.7-9.2 log(picomho/cm) which ensures that the ink has sufficient conductivity in order to be successfully ink jet printed (col.3, line 19, lines 29-30 and 35-37).

The appellant also acknowledges (Brief, page 26) that:

Tobias et al. discloses a hot melt ink composition for use in continuous ink jet printing comprising an electrolyte, an electrolyte solvating and dissociating compound, and an image-forming agent, said ink being solid at about 25°C, said ink liquefying at a temperature between 75°C and 175°C, and said ink in the liquid stage having a conductivity of greater than about 100 microsiemens/cm.

Thus, we determine that one of ordinary skill in the art would have been led to ensure that the hot melt ink composition of Schwarz has sufficient conductivity, such as that claimed, so that it can be "successfully ink jet printed" during the continuous ink jet printing process.

Accordingly, we affirm the examiner's decision rejecting claims 6 and 16 under 35 U.S.C. § 103.

We turn next to the examiner's rejection of claim 7 under 35 U.S.C. § 103 as unpatentable over Malhotra in view of either



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Schwarz or Siddiqui, Watt and Takazawa, and further in view of Nishizaki. The examiner relies on Nishizaki to show that one of ordinary skill in the art would have been led to obtain the claimed haze value of no more than about 25 in the ink composition of Malhotra. See the Answer, page 8. However, as argued by the appellant (Brief, page 28), Nishizaki does not teach employing such haze value to a hot melt composition containing at least one polyamide and at least one terpene resin. There is nothing referred to by the examiner, which shows that such haze value is useful for the ink composition of the type disclosed by Malhotra and/or Schwarz. Nor is there any teaching in the applied prior art references that shows how such haze value can be obtained in the ink composition of Malhotra and/or Schwarz.

Accordingly, we reverse the examiner's decision rejecting claim 7 under 35 U.S.C. § 103.

We turn next to the examiner's rejection of claims 14 and 15 under 35 U.S.C. § 103 as unpatentable over the Malhotra in view of either Schwarz or Siddiqui, Watt and Takazawa, and further in view of Shacklette and Han. The content of Schwarz is discussed above. The examiner recognizes that Schwarz does not describe or suggest employing the claimed complex of a dianiline and a phosphorus-

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containing acid as a conductivity enhancing agent in its hot melt ink composition. See the Answer, page 9.

To remedy this deficiency, the examiner relies on the disclosures of Shacklette and Han. The examiner finds (Answer, page 9), and the appellant does not dispute (Brief, pages 32-33), that:

Shacklette discloses the use of polyaniline complexes with phosphonic or phosphinic acid in order to impart conductivity and enhanced thermal stability to polymers including formaldehyde-sulfonamide (col.3, lines 45 and 66-68, col. 9, lines 39-41, col. 10, lines 1 and 3 col. 12, lines 30-38, col. 13, line 9, and col. 18, lines 40-42). Although there is no explicit disclosure that the complex is suitable for use in inks, it is well known in the art as found in state-of-the-art references such as [Han] (page 17, lines 25-26) that these polyaniline-phosphorous-containing acid complexes are indeed suitable for use in inks.

Thus, we determine that one of ordinary skill in the art would have been led to employ the claimed complex of dianiline and a phosphorus-containing acid taught by Shacklette and/or Han in the hot melt composition of the type described in Schwarz, motivated by a reasonable expectation of successfully imparting desired conductivity and enhanced thermal stability.

The appellant does not argue that there is no motivation to employ the complex taught by Shacklette and/or Han in the hot melt ink composition of Schwarz. See the Brief, pages 32-33. Rather,

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the appellant only argues that Shacklette and Han do not remedy the deficiencies of the applied prior art references, including Schwarz, regarding the limitations of claim 1. *Id.* Thus, for the reasons indicated *supra*, we affirm the examiner's decision rejecting claims 14 and 15 under 35 U.S.C. § 103.

We turn next to the examiner's rejection of claims 23 and 24 under 35 U.S.C. § 103 as unpatentable over the combined disclosures of Malhotra and Watt. For the reasons set forth above and the reasons set forth at pages 34-36 of the Brief, we reverse this rejection. As argued by the appellant (*Id.*), there is no suggestion or motivation to combine the binders taught by Watt in the ink composition of Malhotra as both Watt and Malhotra are directed to employing materially different ink ingredients for different purposes.

Pursuant to 37 CFR § 1.196(b)(2001), we enter a new ground of rejection against claim 24. Specifically, claim 24 is rejected under 35 U.S.C. § 103 as unpatentable over the disclosure of Schwarz for the reasons indicated *supra*. Claim 24 is dependent on claim 1 and recites that the aldehyde copolymer ink vehicle recited in claim 1 is, *inter alia*, poly(p-toluenesulfonamide-co-formaldehyde) which is suggested in Schwarz as indicated above.

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### CONCLUSION

In view of the foregoing, we affirm the examiner's decision rejecting claims 1 through 6, 8, 9 and 11 through 21 under 35 U.S.C. § 103, but reverse the examiner's decision rejecting claims 7, 10, 23 and 24 under 35 U.S.C. § 103. Pursuant to 37 CFR § 1.196(b)(2001), we enter a new ground of rejection against claim 24 and denominate our affirmance of the rejections of claims 1 through 6, 8, 9 and 11 through 21 as involving new grounds of rejection. As is apparent from this decision, our reasons for affirming the rejections of claims 1-6, 8, 9 and 11 through 21 are materially different from those provided by the examiner.

This decision contains a new ground of rejection pursuant to 37 CFR § 1.196(b). 37 CFR § 1.196(b) provides that, "A new ground of rejection shall not be considered final for purposes of judicial review."

37 CFR § 1.196(b) also provides that the appellant(s), WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of proceedings (§ 1.197(c)) as to the rejected claims:

- (1) Submit an appropriate amendment of the claims so rejected or a showing of facts relating to the claims so rejected, or both, and have the matter reconsidered by


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the examiner, in which event the application will be remanded to the examiner. . . .

(2) Request that the application be reheard under § 1.197(b) by the Board of Patent Appeals and Interferences upon the same record. . . .

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART; 37 CFR § 1.196(b)

  
CHUNG H. PAK

CHUNG ~~K.~~ PAK  
Administrative Patent Judge

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Administrative Patent Judge

ROMULO H. DELMENDO

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